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The Shrubbery in Winter.

IN another column a correspondent calls attention to some winter effects in the wild shrubbery which interested him, and, perhaps, it is worth while to repeat what we have often said—that when home-grounds are planted there are many cases where more attention should be given to their winter aspect. Where a house is occupied in summer only, the principal aim should be to make it attractive at that season. There are many trees and shrubs which are conspicuously beautiful in spring and autumn, and, of course, there are places where the selection of species and varieties should be made with special reference to these seasons. But where a country house is occupied in winter it can readily be seen that in some part of the grounds commanded by the windows of rooms appropriated for winter use provision should be made for the prospect at this season. In the middle of this century it was not uncommon to have a glade or lawn in such a position bounded by Spruces, Firs, Hemlocks, Pines and other conifers with such broad-leaved evergreens as Kalmias, Rhododendrons, American Hollies, and some herbaceous plants with persistent foliage, like Yuccas, for example, and the whole brightened by a few shrubs with colored fruit, like the Carolina Rose, Black Alder, Cockspur Thorn, Snowberry and Bittersweet. Such an arrangement has some merits, although the idea that this green foliage brought in a touch of summer when January was at its bleakest was rather fanciful. Any effort to produce summer scenery in winter must be a failure, as, indeed, it ought to be, for what is desirable at a particular season in the landscape is an effect which will harmonize with the prevalent tone of that season, rather than one which conflicts with it. As a matter of fact, however, there is no hint of summer in the winter aspect of evergreens. In freezing weather their darkened foliage only emphasizes the strength of the cold, and the particular human interest they have at this season is their hospitable suggestion of shelter against the driving winds. Whatever is especially home-like and companionable or genial in their winter appearance is not that they remind one of summer verdure, but that they are sturdy enough not only to brave the wildest weather, but to give us some protection against its blasts.

Following the fashion imported from the mother country, coniferous trees were too exclusively planted in the early years of the century, and we can all remember country houses which were half-smothered in summer under the gloom of their heavy foliage. Perhaps the reaction against this has been too decided, and some of these trees which are beautiful at all seasons are too much neglected. Nevertheless, there is an abundance of beauty and variety to be found in deciduous trees and shrubs at this season, and in any scheme of planting for winter effect in this climate they should have the largest place. Most trees have a beauty in winter which is quite as distinct and individual as it is in any other season. Indeed, this is the best time for studying the peculiar structure or framework of a tree—that is, for noting how its branches diverge and the manner in which they break into spray. The special characteristics of a particular species, whether of dignity or grace, are shown as well when the trees are stripped of their summer garments as at any other time, and never until the leaves are gone can we mark the peculiar beauty of the different figures made by the interlacing branchlets against the sky. There is no need to speak of the endless varieties in the shade and texture of the bark, both of trunk and limb and spray, and it is well known that the richest colors in a winter landscape are those of the warm browns of a distant wood. The colors of the small twigs are especially varied, too, and the tinted mist which hovers over a shrubbery a few hundred feet away is collected from the mingled colors of the bark on the smaller branches.

This brings us to a point in planting shrubbery for winter effect which we wish here to insist upon. In former articles we have given lists of various shrubs which are ornamented with brightly colored fruit until midwinter, but we have not so often named those whose bark lends a pleasing color to the short days of the year. The glossy green branchlets of the Kerrias, the golden bark of the Willows which warms into still brighter yellow with the approach of spring, the ashen gray of some of the Viburnums and the scarlet twigs of the Dogwoods make pictures of unfailing beauty, either against the glittering snow or the brown earth. Taking the Cornels alone one is surprised to find the variety of form and color they display at this season. Our common Red Osier, Cornus stolonifera, with its broad leaves, pale flowers and bluish white fruit, is ornamental all summer. Its leaves turn purple and yellow in autumn, and now its purple-red branches sustain its beauty in midwinter. There is a variety of the plant, too, with golden-yellow bark, specimens of which have been exhibited by Mr. Warren Manning at the Massachusetts Horticultural Society, and it is distinct and striking. Cornus alba, the common European Red Osier, which is often sold by nurserymen as Cornus sanguinea, is another bright-barked plant. It is a variable shrub, and one strain, which is called alba Sibirica, has stems of almost vermilion. Cornus circinata, too, one of our native species which is found on wooded hillsides, in addition to its beautiful flowers and light blue fruit, has red and yellow stems which are sometimes finely mottled, while Cornus candidissima has an ashen gray bark of a singularly soft texture. Certainly a group of these Cornels properly arranged gives a pleasing stretch of varied color, and with judicious selections from other families, by harmonious contrasts, a most interesting feature can be added to our winter landscapes.

The San José Scale in New Jersey.

IN our report of the late meeting of the New Jersey State Horticultural Society, brief mention was made of a paper on the San José scale by Mr. Charles R. Parry, in which he described its destructive nature, the spread it had made in the state of New Jersey, and asserted, from his own observation and from information obtained during his visit in California, that certain natural enemies were controlling it in that state, and that the growers had ceased to regard

it as a pest to be dreaded, largely because of these natural enemies. These enemies, certain ladybirds imported from Australia against the fluted scale, Mr. Parry had tried unsuccessfully to introduce into New Jersey, and he argued that the best hope for the control of this destructive pest in that state lay in securing a supply of them. The paper brought out some discussion, and it was held by some of the most careful observers that differences of climate would prevent the ladybirds from being as effective here as they are in California. Since this meeting we understand that a flying visit through the infested regions has been made by the Entomologist of the New Jersey Experiment Station, who has discovered that Mr. Parry's assertions concerning the spread of the scale were unfortunately too well justified. In many orchards where the presence of the scale had not been previously suspected it was unpleasantly conspicuous, and one case was discovered where the insects had been carried for nearly, if not quite, a mile in a straight line, probably by the agency of birds. In the course of an address before the New Jersey State Board of Agriculture, held at Trenton January 14th, Professor Smith called attention to these facts and to the danger threatening the fruit industry of the state. So much alive were the farmers to the importance of the subject-matter that, after some discussion concerning the probability of a successful importation, a resolution was adopted, asking the Legislature of New Jersey for an appropriation of one thousand dollars for the purpose of importing into the state of New Jersey such of the predaceous or parasitic insects as might be found feeding upon the scale in California or elsewhere. The resolution was unanimously adopted, and was at once referred to the legislative committee and will be pushed as soon as the Legislature reconvenes. There is no doubt as to the importance of the matter, and there is no doubt that the state of New Jersey owes it to so important an industry as that of fruit-growing to offer it every possible measure of protection. The sum asked for is ridiculously small compared with the possible benefits, and there seems to be at least a fair chance of success. Of all the Atlantic fruit states New Jersey is worst infested and has most to lose, while offering unusual facilities, from its numerous closely set orchards, for the spread of the scale.

Perhaps it is worth stating that the late Dr. C. V. Riley, by whose advice the predaceous insects that so completely destroyed the Cottony Cushion scale were introduced into California, after visiting that state early in 1895, argued at a meeting of the Entomological Society of Washington that an attempt should be made to import the coccinellids from the Pacific to the Atlantic coast. The opinion of so conservative a man ought to have some weight in a question like this, and we think that there is sufficient probability of success to justify the experiment.

Self-reliance in Farming.

IN a recent editorial article in this journal it is said that one advantage of a broad education in agriculture is that it makes more self-reliant men, and I am prompted to add a few observations on this subject. For many years the farmer has been scolded on every hand for following the ways of his father and grandfather in managing his farm. This steady rain of advice, urging him to turn from the accustomed ways of his fathers, was freely offered even before there was sufficient knowledge of a true science of agriculture to give the advice any specific merit. If the farmer must take up new ways, it was not too much to ask that these new ways be defined and described. But, for the most part, no adequate method of revolution was proposed, although it was easy to see that there was reason enough for a change. Under the circumstances, the farmer, of course, did little or nothing. He felt that little could be gained by jumping from the frying-pan when the chances were that he would land in the fire. He accepted the advice as good on general principles, but he saw no way of paying mortgages with it.

Now all has changed. With the advent of the experiment stations and the Babel of new teaching, there are methods and to spare for the improving of farming. The farmer will be scolded no longer. He will convert himself to the new ideas forthwith, and he will ask for advice and help in every emergency; for, were not the stations and the agricultural colleges made for his benefit? But, really, the great danger now is that the farmer will lose something of his accustomed balance and self-reliance, and desire a doctor from an experiment station whenever a strange bug or a perverse soil perplexes him.

Every experiment station is burdened with questions which it cannot answer, and never can answer. They are local questions—questions which do not have to do with principles, but with the particular matters which pertain to the one farm or to the personality of the farmer. The commonest question of this type is, "What varieties shall I plant?" Now, this question no one can answer for another. It is purely a local and personal question. For myself, I invariably refuse to advise. I am willing to say that I know some varieties which please me, and to name them, but I cannot advise any one else to plant them. The question really shows that the questioner has not yet mastered and adopted the fundamental principle of the modern teaching, which is that every man must manage his farm as seems best for his particular conditions and aspirations. If he asks what varieties of apples he shall plant for drying, or what he shall plant for the foreign markets, then a more direct answer can be given him; and the questioner has arrived at the point of observing that successful farming is not copying after others, but is the working out of a local problem.

All this is equivalent to saying that the experiment station and the agricultural college do not exist for the purpose of managing everybody's or anybody's farm. More than ever before, the farmer must collect opinions and evidence, then weigh them and choose. The stations should enunciate principles—illustrating them by concrete examples—rather than lay down rules.

Cornell University. *L. H. Bailey.*

Trees of Minor Importance for Western Planting.—II.

THE Russian Mulberry was brought to America in great numbers by the Mennonites, who, during the decade following 1870, settled in large colonies in Marion, McPherson and Harvey counties, Kansas. By them it was introduced to their American neighbors, and was quite extensively planted in that vicinity. Many of these planters seem to have expected too much of it, for it has evidently declined in favor in recent years. As grown in this section, it is notably polymorphous in fruit, foliage and form of the head. Varieties appear bearing pure white fruits, and others deep black ones. Occasionally a tree of the black-fruited sort appears to be wonderfully productive. I have seen the fruit sold in the market, bringing six to ten cents a quart, but the demand is not great, and the bargain is a poor one for both buyer and seller. The fruit cooked with gooseberries or other very acid amendments is palatable, and in the absence of blackberries and raspberries is not altogether to be despised.

Throughout central Kansas and eastern Oklahoma Morus rubra is native to the streams, and though not common, wild or cultivated, makes a good tree. In the scattered instances where I have seen it planted it gives a uniformly vigorous growth, with clear straight trunk, symmetrical top and dark rich foliage. It seems to me that it should have had a more extensive trial in timber plantings.

The western limit of the Sycamore, Platanus occidentalis, runs through Salina, Marion and Winfield, Kansas, and Guthrie, Oklahoma. East of this line it is neither abundant nor uncommon along streams, and within its natural territory is sometimes used as a shade tree or for streets. It seems to be well adapted to street-planting. The best planted specimens I have seen are at Manhattan, Kansas, where one tree in particular, standing by itself and having

a remarkably straight and symmetrical form, has always met my warmest admiration.

The Hackberry is indigenous over as great a longitude as almost any western tree, yet it has very seldom been planted. I know of no plantings from which any judgment of its value might be formed.

University of Vermont. *F. A. Waugh.*

Water against Frost.

OF course there is no way of protecting plants or crops from injury when the temperature falls several degrees below the freezing point, but for light frosts the practice of burning any material that will form a dense smoke has been found useful in vineyards by forming a canopy over the field, which prevents the escape of heat by radiation from the ground. Protection by water is, however, more practicable than protection by fire, and we condense the following notes from an article by Professor Kedzie, of the Michigan Agricultural College, which appeared originally in the bulletin of the Michigan State Weather Service:

The vapor of water in the atmosphere may control excessive changes of atmosphere in two ways: (1) By condensing into water, it liberates enough heat to raise through one degree the temperature of a thousand times the amount of water condensed, and hence it arrests the fall of temperature by giving out heat. In this way the beneficent dew becomes a warming-pan for chilling fields. (2) Vapor of water in the air as well as clouds prevents the escape of heat by radiation from the soil, and the consequent cooling of the air by night. But for the vapor of water in the air we should have a frost every night in the year. Professor Tyndall says that the removal for one summer-night of the aqueous vapor which covers England would bring about the destruction of every plant which a freezing temperature could kill.

If the farmer is forewarned of the approach of a slow frost he may do something to avert the calamity. The old plan of a tub of water under a fruit-tree with a rope reaching from the tub into the branches may serve a useful purpose. The evaporation from the water in the tub and of the water carried up through the rope may spread a water blanket about the tree. Of course, such an appliance, while of some use in a small garden, would be futile on the farm. The shallow cultivation of hoed crops draws by capillary action upon the reservoir of water in the subsoil and keeps the surface soil in a condition which prevents the rapid distribution of soil moisture, and in this way saves the fields from frost by a covering as impalpable as air, but as effectual as eider-down. One night the Indian Corn in Michigan was almost entirely killed by frost, but a few fields on the banks of rivers and the borders of lakes were spared. In these fields the Corn-stalks next morning were dripping with dew. There had been but one-eighth of an inch of rain in two weeks, but evaporation from river or lake had moistened the air and staved off the frost. If the air over the whole state had been as moist as it was along the rivers a heavy dew would have fallen everywhere, and the corn crops would have been saved. Beds of Coleus and other tender plants which have been thoroughly wet down with cold water in the evening have escaped frost in October when other plants near by were killed, and grapes have been saved by drenching the vines with water. Strawberries and Grapes in blossom may be saved in the same way if a good supply of water and a sprinkling hose are available when there is threatening frost. Even after severe frosts grapes have been saved by thorough drenching with water early in the morning.

Mr. E. P. Powell says that the best preventive against frost is a thorough spraying with water during the evening and night. By this means the danger from a fall of two or three degrees can be averted, and this will often save a whole crop.

Foreign Correspondence.

The English Fruit Market.

ONE of the leading salesmen of Covent Garden Market, Mr. G. Munro, lately dealt with the subject of the fruit-supply of England in a paper read before the Horticultural Club. It is difficult to arrive at even an approximate estimate of the annual consumption of fruit in the United Kingdom, but as the bulk of what is placed upon the market passes through Covent Garden, Mr. Munro is in a position to gauge the supply with some approach to accuracy.

There are between seven and eight hundred porters employed day and night in Covent Garden Market in unloading and delivering English produce, and one hundred and fifty on the average employed on the foreign supply. Many English growers, and not a few among the foreigners who send fruit to England, find it advantageous to consign their produce direct to large centres all over the country, such as Manchester, Leeds, Glasgow and Edinburgh. Mr. Munro stated that the English are becoming much larger fruit-eaters than they were, the demand having increased to such an extent that the principal growers find it more profitable to become specialists. "The grower who sends the largest quantity of a good article regularly, makes a large connection for his goods, large consignments often selling to better advantage than small ones, though the quality of the latter may be equally good."

Where the foreign grower competes with the English in supplying the same kind of fruit he generally succeeds for the following reasons: 1. He packs his fruit carefully and honestly and never fails to grade it. 2. He grows only sorts that are sure to sell, and in such quantities that he can keep up a regular and continuous supply. This is shown in regard to apples, which are rarely a profitable crop with the English grower, notwithstanding the suitability of our climate for this fruit and the fact that English apples are far better in quality than any foreign. "I was in a large wholesale store in Manchester this autumn where they had English and American apples side by side, and on asking the quantity of each sold I was informed about three thousand bushels of American against one hundred bushels of English, and simply because the packing of the latter could not be depended upon."

Apples are imported into England nearly all the year round, commencing in April from Tasmania, followed by supplies from France, Italy and Germany, and in winter from the United States, Canada and Nova Scotia. American apples are better in flavor than those from Tasmania, and, as a rule, they sell at prices which would scarcely remunerate the English grower. Mr. Munro does not deal with the question of cost in producing, nor yet with the relative uncertainty of the seasons in England.

Pears are imported chiefly from France, Italy and California, the latter arriving in excellent condition and being of good flavor. About a thousand cases weekly of Californian pears, chiefly Easter Beurré, arrive in December, and about six times that quantity in September. Strawberries, currants and cherries are imported in enormous quanties from France and Spain. Plums, such as the Green Gage, are received from Italy, France and Germany for a period extending over about three months before the English crop is ripe, as many as ten to fifteen thousand flats being often sold daily in Covent Garden alone. Thus, the English consumer gets a surfeit of these fruits by the time the home supply is ready.

Pineapples are received in shiploads from the Azores, and although the prices they realize are much lower than they used to be, the supply is steadily increasing. The cost of producing pineapples in England is so great that an English-grown pineapple is a novelty in the market. Pineapples are also received from Africa and Florida.

Bananas are sold in increasing quantities annually, the quality of the fruit being superior to what it was before, now that choice sorts are grown and greater care taken in the transport. There are much better sorts known even than the best of those grown by exporters now, and if only growers will take trouble to secure these the demand for this most delectable of fruits will increase greatly. The ordinary banana of the fruiterer is mawkish and poor in flavor compared with the fruit of such varieties as Ran-Kela, Champa and Pisang Rastalei. Mr. Munro stated that the bananas received in London and Liverpool in November last, from the Canary Islands alone, numbered nearly thirty-seven thousand bunches.

Peaches and nectarines grown in England, if of good quality, find a ready sale, and suffer nothing from the competition of foreign supplies, which are either of inferior sorts, unripe, or too much damaged to find much favor. Expert growers of these fruits contrive to maintain a supply from April to November by cultivating a variety of sorts under different temperatures. Mr. Munro says there were often a thousand boxes of English-grown peaches and nectarines disposed of daily last year in Covent Garden. I have tasted here peaches from California which compared favorably with the English-grown fruit.

Grapes are in greater demand than ever. Enormous quantities are imported from the Cape, Spain, etc., yet cultivators in this country find this fruit a profitable investment, the acreage of glass devoted to it being largely increased every year. I am told that good grapes grown under glass in England pay at one shilling per pound. The varieties cultivated are chiefly Alicante, Black Hamburg and Gros Colman. About one thousand tons of English-grown grapes are now annually marketed in this country, and nearly twice that quantity are received from the Channel Islands, where grape-culture has become a staple industry. Even Belgium sends forced grapes to the English market, about two hundred tons being received from that country last year, a prohibitive duty practically closing the Paris market to them.

Cucumbers at one time were largely imported from the Continent, but now English growers supply the Continental markets as well as their own. Mr. Munro estimates the supply of this fruit from March to the end of July at about fifty thousand per day.

The increase in the consumption of Tomatoes in England within the last ten years has been phenomenal. They are a certain source of profit to the beginner with limited capital, being easily grown and marketed and readily sold. The quantity of house-grown fruit that passed through Covent Garden Market alone from March to November is estimated at two thousand tons, and this is probably only a tithe of what is marketed throughout the country. I know a market grower in the provinces who cannot sell apples and pears at any price, while his tomatoes offered direct to the same consumers sold readily at sixpence per pound, the price asked for six pounds of apples. My friend proposes to leave the supply of apples and pears to the foreigners, and to devote himself entirely to tomatoes and cucumbers.

London. *W. Watson.*

New or Little-known Plants.

Chrysanthemum, Mayflower.

THIS plant was raised in 1892 from seed of Fascination by Mr. John N. May, of Summit, New Jersey, and it was exhibited for the first time in the autumn of 1893, but it received comparatively little notice on account of the fact that it was rather too early for the great exhibitions. It was distributed in the spring of 1894, and at the autumn exhibitions that year it took prizes wherever it was shown, while the flowers sent to market by Mr. May brought higher prices than those of any other variety. The plants had a remarkable sale last spring, and in the autumn the flowers took the leading prizes in most of the great cities of the United States wherever white varieties were in competition. It is a first-rate flower for commercial purposes, and ranked last year in our leading markets as the best of its season. It is a sturdy grower, with large handsome leaves and remarkably stout stems, carrying erectly massive, though not coarse, blooms of a pure white color and of firm texture. It has the light and somewhat fluffy appearance of many Japanese incurved varieties, and the florets are wavy-twisted, the lower ones being reflexed (see fig. 5, page 45). It was at its best this year during the last week of October and a few days into November, though, with careful management, Mr. May thinks it can be carried well into the middle of the latter month. Last year the largest flowers measured eight to nine inches through and from twenty-two to twenty-five inches over from the lower petals on one side to the same point on the other.

Cultural Department.

Lily Blight.

THE Lily blight, which has not troubled plants in this locality to any extent for a number of years, was noticed here last season on a good many species. It seems to attack Lilium candidum first, and spreads from it on to the other early sorts. I have noticed the blight on the fall growth of the leaves of L. candidum, and have wondered if it did not winter on these and spread in spring from them. It was noticed as late as December, after cold weather had set in. Of course, one's opinions formed from a single year's experience may not be correct, but, from what I have seen, I am led to believe that a timely and thorough application of the Bordeaux mixture will overcome it to a great extent, if not entirely. I was surprised to note that our native Lilies were among the first to be troubled. L. Canadense, L. superbum and L. Philadelphicum were troubled, but it did not apparently injure their bulbs. It may be that, though the mixture was applied to these after the disease had made considerable progress, it prevented its descending to the bulbs. L. Humboldtii and L. croceum bulbs seemed to suffer more than any others noticed. L. Parryi was cut down by it, but the bulbs were left apparently sound. L. giganteum and L. cordifolium both were injured. A bed of the two or three varieties of L. speciosum, which had come up very early and had been nipped by the late spring's frost, were cut back by the disease, while other lots of this same Lily were not touched. The bulbs of L. speciosum were not apparently injured, except that they did not make any growth. The blight had made a good foothold before I was prepared to apply the remedy, and on this account I believe that if I had taken it in season very little damage would have been done. It had gone so far that the flower-buds of L. Leichtlini began to droop and they seemed past help. I was surprised to see these recover after the first application and develop good-sized blooms. A friend who had been troubled with the disease, in another state, had advised me to cut down at once all stalks that had been affected. I did so with every plant of L. croceum, and they were injured in the bulbs the most of any. I believe if I had not cut them down, but had used the mixture on them, I would have saved all of the bulbs. I noticed that some species could be entirely cut to the ground with the blight and still no apparent damage was sustained by their bulbs. Others, like L. Humboldtii and L. croceum, would be affected. A bed of L. Nepalense had been planted very late, the bulbs having been brought that same year from Burma. As soon as these began to form leaves of any size they were attacked by the blight. I applied the remedy several times very thoroughly, and saved nearly all. They gave very fine blooms and were the last Lilies to flower, some buds opening after the leaves had frozen turning dark.

I think the best time to apply the remedy is before it shows itself, or immediately after. It will not do to wait long after the first spots are noticed. The mixture should be applied in a fine spray to the upper surface of the leaves and also to the stalks, so as to completely cover them. I found that the mixture was more effectual when used soon after it was prepared. To facilitate the application of the mixture I prefer to have my Lilies in rows, two or three abreast, and the rows far enough apart to admit a narrow cultivator. In beds it is almost impossible to touch all of the leaves and stems in the centre of the bed with the mixture. Of the Tiger Lilies, the variety called Splendens seemed free, or nearly so, while both the common Tiger Lily and the double Tiger Lily were affected.

The blight was noticed more or less on about every species I had, but on some of them it was very light. I noticed that L. Henryi seemed least affected, although it was near plants of L. candidum. This species, if it will stand cold weather, is one of the surest to succeed. Young Lilies, too small to bloom, were soon cut back. The blight seems to prefer their more tender leaves. A lot of small L. Canadense cut back in this way very early in the season were transplanted and the bulbs seemed to be perfectly sound. Young bulbs of L. Wallacei were affected, and when these were reset many had to be discarded. These had been entirely killed down to the ground before the mixture was applied.

Fig. 5.—Chrysanthemum, Mayflower.—See page 44.

The Lily blight is not new to this town. It was noticed here by Pringle fully fifteen years ago. It seems to come and go like the Potato blight, which it closely resembles in many ways. A part of last season was quite favorable to the development of both in this section.

Charlotte, Vt. *F. H. Horsford.*

Cultural Notes on Orchids.

THE close observer of this class of plants, whether a cultivator or a plant physiologist, cannot fail to remark that there are certain periods of rest and activity that are well marked by the plant itself. Sometimes these periods do not conform to our seasons, but, for the most part, the plants adapt

themselves to the changed conditions under which they are placed, and respond to a rational system of treatment. It often puzzles the grower to know what to do with a plant that has apparently made its growth for the season early in the fall months and then makes another start, the later growth having to finish up during our winter months under adverse conditions as to light and air, the two most potent factors after warmth and moisture. This is frequently the case with newly established plants which have not quite adapted themselves to the changed seasons. Sometimes it occurs in the case of well-grown plants that have been in a collection, perhaps, for years. We have come to the conclusion that to try and retard this tendency by keeping the plants overdry at the roots is to cripple seriously latent energies; to place them in a warmer temperature with more moisture to encourage this growth results in throwing the whole mechanism of the plant out of gear. We have found it best to ignore the fact that anything abnormal is going on and to let nature rectify its own error, if error it be. Often this seems to be merely a safety valve for the escape of a superabundance of vigor, for, excepting the newly established plants, this peculiarity is confined to plants that are the most robust.

European cultivators, to whom we have been indebted hitherto for our works of reference on this subject, have laid great stress on the ripening up of growths by withholding moisture, but, aside from the fact that this system is not practicable here, owing to the greater amount of sun we get and the much larger amount of artificial heat required to maintain the proper temperature for the plants. All these conditions tend to exhaust the store of moisture, which in the case of a Cattleya bulb, whether old or new, averages over ninety per cent. Aside from these facts, the most advanced cultivators in Europe are beginning to see the fallacy of this system and to teach a more rational treatment.

It is also easily seen by the interested student that there are times when a plant is putting forth new efforts in the way of a bunch of young live roots from the base of the last-made growth. Often this is by way of fortifying itself for the crowning effort of producing flowers, and sometimes of recuperation afterward. In either case it will be found good practice to take advantage of these signs and to give any encouragement possible, such as new material and a larger pot if this is deemed necessary, remembering that decayed inert matter about epiphytal Orchids is death to roots, whether young or old. Care should be taken to remove every particle of decay by directing a jet of water on the mass before placing in new material. It would have been considered bad treatment by the authors of the reference-books to repot a Cattleya at the approach of the dull winter months, but it will be found here in practice that any day of the year is a good time, provided the plant shows signs of renewed activity at the roots, a sure index that will never betray either the plant or the cultivator.

Cypripediums are to be regarded more as terrestrial plants. They will take water freely all the year, and may be repotted at almost any time. This is a good time, as the roots are, for the most part, dormant, or have but few growing tips, and these are not so easily injured as the brittle white roots of the epiphytes. If a Cypripedium holds tenaciously to the pot in which it is, as is often the case with older plants of C. insigne and its hybrids, it is well to soak the roots in water the day before potting, and, if it is necessary, to break the pot to liberate the roots. The broken parts will easily separate when charged with moisture, and this is true of Cattleyas and other genera. It is not economical to spare the pot when the contents represent, possibly, as many dollars as the pot does cents. For such Orchids as require a quantity of water at all seasons it is safe to use sphagnum-moss liberally in the potting material. Cypripediums and Odontoglossums belong to this class. Dendrobiums, we find, do well in moss alone, for it can be easily washed out each year and new living moss added, but for Cattleyas we have for several years used no moss, and only the best grade of Osmunda-root. The moss, we find, only hastens the decay of the fibre, and when the latter is used alone there is no danger from overwatering, and the compost is well aërated at all times, a condition favorable to the development of good live roots, apparently the basis of vigor and success.

Much can be done to render the atmosphere agreeable to the occupants of our plant houses besides the ordinary applications of moisture on the paths. An occasional damping down with some liquid stimulant is desirable, and we have found that a minute proportion of sulphate of ammonia in the water has a beneficial effect, giving a healthy green color to the foliage. A quantity of Oak leaves brought in twice a year and placed under the centre benches helps to give off ammonia. These should be well treated with air-slacked lime to prevent snails and other insects from coming forth, but I am told that the lime would help to impoverish the supply of carbonic acid gas, and in this way not be a benefit, although liberating the ammonia contained in the decaying leaves. Fresh air, as often as available, is one of the chief essentials to keeping a healthy atmosphere. This is not easy when the temperature is far below the freezing point outdoors, but a system of ventilators near the heating pipes makes it easy to warm the air as it comes into the house. Even in hot weather this is the better way to change the air in preference to opening wide the top ventilators and letting out all of the carefully balanced moisture-laden atmosphere we have been at so much trouble to prepare. Greenhouses are seldom constructed with openings in the brick-work for ventilation, but this is most essential for successful culture and should be more insisted upon than it is. Water also that is taken from the supply-pipes direct is far too cold in winter for spraying or watering. Here it averages forty-five degrees in the winter months, and it is not well to use it for spraying a house at from seventy to eighty degrees. We have in part overcome this difficulty by placing on the warmest flow-pipes a cylinder holding sixty gallons, and taking the water from this to the warm houses. The water is let in at the base of the cylinder and out at the top, and in this way we secure a supply of tepid water adequate to our needs at all times when fire heat is used.

White scale is the worst enemy the Orchid grower has to contend with; it comes on the plants as they are received from the woods, and increases at a rapid rate, but a fine jet of water, as from the Stott sprayer, will, if used with a good force, effectually rid the plants of this pest, and without the least injury to them.

In successful plant-culture it is the trifles that tell. Sometimes they are inappreciable to the cultivator himself and a puzzle to others, but more often they are wholly at the will of the careful student who avails himself of the signs given by the plants themselves. A system that is haphazard is likely to give results that correspond.

South Lancaster, Mass. *E. O. Orpet.*

Greenhouse Notes.

WHILE the common practice of banking flowering and foliage plants in the conservatory for effect may be agreeable from one point of observation, and may be excused when following architectural lines, it is more advisable generally to show as much as possible the individual character of the plants. Lately I have seen some very fine trained standard plants effectively used in this way. One of these, Adhatoda cydoniœfolia, I found in the greenhouses belonging to Mrs. Pauline Durant, of Wellesley. This elegant rafter-plant, allied to the Justicias, and belonging to the Acanthaceæ, was introduced from Brazil in 1855. It is naturally of straggling growth, and in forming a standard one stout stem had been carried upward six feet and attached to a strong support. From a head made the branches diverged in all directions, arching outward and downward, some of them reaching the ground, forming a perfect pyramid. Nothing more beautiful than this plant in flower can be imagined, with bunches of large labiate pink-colored flowers borne on the tips of the branches. It is an easy plant to grow, propagating freely from cuttings in an ordinary propagating-bed, or they may be put in pots of half light loam and sand and stood in a warm shady corner of the greenhouse. Although usually recommended the treatment accorded tropical plants, they will grow well out-of-doors in summer, and will bloom quite freely in December in a greenhouse of intermediate temperature.

Streptosolon Jamesoni is another plant which by careful training can be grown into a handsome standard. It grows rapidly when young, and training must begin as soon as the plant is a few inches high, since it branches freely and would soon be out of hand for training purposes. At Mr. H. H. Hunnewell's place at Wellesley there is now a beautiful specimen in bloom, with a clear stem of about four feet, and above this an unevenly globular head of the same diameter. Some branches are longer than others, and some drooping, with just enough variation in length to offset an otherwise formally trimmed appearance. The flowers are borne in loose terminal corymbs at the ends of the branches; they are narrowly campanulate, with an irregularly rotate limb of brilliant orange-color. A second crop of flowers follows closely on the first, from laterals developed while the first crop is open, and with a little trimming away of dead flowers the plant remains fairly effective during the remainder of the winter. The best results are obtained by continuous pot-culture. Those we have

planted out have grown too rampantly, and have been with difficulty established in pots when taken up in the autumn.

All who have seen Richardia Elliottiana are captivated by its beauty. In habit it more nearly resembles R. albo-maculata, and in the manner of its growth our common Arisæma, blooming in early summer and afterward going to rest. It increases very slowly, the bulbs developing eyes only when two or three years old, and these are with difficulty established when removed. It is an expensive plant and likely to remain so until some more successful way can be found of propagating it. A silver medal was awarded Mr. Joseph Tailby, of Wellesley, by the Massachusetts Horticultural Society, before whom he exhibited two years ago. The plant bloomed also about the same time with Mr. Robinson, at Mrs. Ames' gardens, North Easton, Massachusetts. Both plants have borne seed. Examination of the spadix of the common Calla shows the male and female flowers distinctly divided. They are apparently so in R. Elliottiana, but closer examination shows additional stamens scattered, or masses of anthers, which are apparently sessile among the female flowers, and these are the only ones in which the pollen is ripe at the same time as the stigmas, all the upper staminate part of the spadix having shed its pollen long before, as in the common Calla. This would seem to be a natural provision for self-fertilization, and accounts for the fecundity of the species, as the plants which have borne seed must have been self-fertilizing, as only one plant bloomed at one place at a time.

Mr. Tailby has tried pollenization with the "little green" Calla, and also with the common Arisæma. Seedlings, so far, show only the characters of the female parents. I think it is unlikely that so wide a cross should be productive of any other result.

Wellesley, Mass. *T. D. Hatfield.*

Correspondence.

John Brown's Grave.

To the Editor of GARDEN AND FOREST:

Sir,—Every student of American history must be glad to know that on the 10th of January the Adirondack farm which holds the grave of John Brown was transferred to the possession of the state of New York, to be kept in perpetuity as a public park. And every one who has visited the farm itself must rejoice that John Brown chanced to be buried in so beautiful a place. Chance, however, is hardly the right word to employ in this connection. It is well known that John Brown was not born in this place, but chose it as his residence, fixed upon the exact spot for his future grave and transported from Connecticut to this spot the tombstone upon which the names of some of his forefathers were cut.

This now historic farm lies within the limits of the village called North Elba, in Essex County, about three miles from the village of Lake Placid. But while the latter has become a popular summer resort, with several large hotels, North Elba is hardly more than a village in name. It contains only a few houses, and one may easily drive through it without suspecting that he has reached a place which claims a personal identity. Then, to reach the Brown farmhouse one must turn southward from the highway and follow a narrow, winding and somewhat rising road through a thick tract of woodland for the space of, perhaps, half a mile. Suddenly the forest ceases and one emerges upon a wide and beautiful plateau largely surrounded by impenetrable-looking woods, beyond which to the north are glimpses of stately mountains, while toward the south the ground slopes away, affording a more extended panorama of hills and far-off noble peaks.

Had this approach been carefully planned it could not have been more beautiful or more dramatically impressive. Level green areas as large as the one contained by the Brown farm are rare in this elevated part of the mountain country, and rarely are the painful signs of man's forest depredations so wholly shut out from view. It seems like a fertile, hidden oasis in a land where tangled forests alternate with mournful, fire-swept, barren tracts and with little farmsteads which seem almost as unproductive and are almost as ugly. Within this lovely circle of woods all looks luxuriant and complete, and all is absolutely peaceful; and in the centre of it, close to the farmhouse, rises the singular, isolated, large-rounded bowlder which John Brown selected as his tombstone.

Nothing is cut upon this bowlder, under the shadow of which he now lies, except his name and the date of his death, in plain large letters. Close to it stands the small old stone which he brought from Connecticut. Blossoming Roses and other shrubs twine about them, and the little plot thus formed is surrounded by a simple rustic paling. There is no attempt at "art" and none at ornamentation, except such as Mother Nature could contribute; therefore the effect of the spot is as beautiful as it is impressive, and it is to be hoped that, now it has become a public possession, nothing will be done to "improve" any part of the farm. It should remain as it is—as John Brown saw it and as his family left it. The cottage should be placed in charge of a guardian, of course, but no gardener should be let loose upon the land; and, I think, if a landscape-artist were asked for his advice he would decide that nothing, or very little indeed, should be done to it.

The farm comprises 244 acres, and in the year 1870 was purchased by a number of public-spirited persons in order that it might be preserved from destruction. Miss Kate Field started the subscription for this purpose, and has since been active in urging the transfer of the place into official keeping. Since 1870 a fund has accumulated from the rental of the house and land; and, the newspapers of the moment assert, this fund is to be used "in the erection of a monument on the farm to John Brown's memory." Had I not read these words I should not have been so strongly prompted to write about the place just here and now. But just here and now it should be very plainly said that no money could be expended in a worse way than in building a monument of any possible kind in the beautiful and characteristic spot which I have tried to describe. Its charm, its individuality, its impressiveness, spring from its purely and simply rural character. To build anything ambitious in such a scene, in the vicinity of John Brown's humble little low-browed wooden house, would be an artistic sin of the deepest dye. There would be no excuse for such an act even if the grave were wholly unmarked. Were this the case, only a stone of small size and of the simplest possible sort should be erected. But John Brown already has a monument which he selected himself, and which, in its simple appropriateness to the character of the site and to the character of the man himself, has a greater beauty, dignity and significance than anything that mortal hands could make. No man in America needs, near the place where his body lies, another monument as little as does John Brown. If there is money lying idle, and if it ought to be used to commemorate his name, let a monument be built, but not on the Adirondack farm; anywhere else, but not within sight of John Brown's grave.

New York City. *M. G. Van Rensselaer.*

Our Native Plants in Winter.

To the Editor of GARDEN AND FOREST:

Sir,—The beauty and value of some of our native shrubs, as regards their winter aspects, impressed me more strongly than ever during a stroll along the banks of a stream and through a forest one warm sunny afternoon in last December. The ground was bare, save where it was carpeted with fallen leaves, Hepaticas and evergreen Ferns. Here and there stood groups of Sumach, Rhus glabra, making crimson spots in the landscape. In cultivation this is a desirable shrub, for, though its autumn effects are sufficient to command a place for it in every garden, it is beautiful through the summer also. The smooth glossy leaves show white beneath when upturned in the breeze, and during the latter half of the season its effectiveness is enhanced by the crimson cone-shaped fruit, which is carried late into the winter and long after the leaves have fallen.

The Barberry, too, Berberis vulgaris, thrives luxuriantly in New England, where it is now well established as a wild shrub. The abundance of this species growing beside the path, with its bright scarlet berries, frost-bitten, it is true, but still clinging to the spiny branches, lent a certain brightness and cheer to the surrounding landscape which were fairly exhilarating. Along the banks of the stream Choke Cherry bushes were covered with dense tangles of Greenbriar, Smilax rotundifolius. The prickly and vivid green stems were so closely interwoven as to form an impenetrable screen even in winter after the leaves had fallen, and the blue-black berries clustered against it helped, by contrast, to make it ornamental. The Bitter-sweet, Celastrus scandens, grew there, too, and of all the native shrubby climbing plants none is more attractive when the orange-colored pods open and disclose the bright scarlet seeds.

We are fortunate in having plants that remain beautiful when vegetation is taking its winter rest, and I wonder why they are left outside in the planting of home-grounds, and foreign shrubs introduced which are less beautiful, and often useful for summer effects only.

Experiment Station, New Haven, Conn. *W. E. Britton.*

Meetings of Societies.

Nebraska State Horticultural Society.

THE prevalent financial depression and seasons of drought, instead of discouraging horticultural enterprise, has in Nebraska seemed to quicken it, and the twenty-seventh annual meeting of the State Horticultural Society was more largely attended and enthusiastic than any of its predecessors. The deficiency in rainfall of the last three years, not before equaled in severity for forty years, has served to emphasize the importance of better culture, so that every grower is on the alert to adopt the best possible methods.

IRRIGATION.

Mr. Lute Wilcox, of Colorado, gave a practical talk on methods of irrigation, illustrated by charts, which served to make his statements very clear. To show the importance of his subject he stated that Colorado has $100,000,000 invested in its irrigation plants. The average grade of irrigation-canals is two feet a mile. Sometimes it falls as low as eighteen inches, and in case there is much silt in the water it may need to be as much as three feet. The ditch-walker carries the key to the public gate and governs the amount of water that each landowner can have, and laws are very stringent against any attempt to steal it. From one-fourth to one-third of the water is lost by evaporation, so that it is most important to carry the water the least possible distance to the point where it is to be applied. The furrows for distributing the water have a fall of one inch in from 66 to 100 feet. In ordinary work these are not closer than forty feet apart, and in some cases several hundred feet. Grades in the land are overcome by means of check-dams. Water must never be put on land unless there is an opportunity to drain it away; otherwise the land will become over-wet and worthless. The furrow system is the most practical, and is especially adapted to fruit-culture. In orchard work two furrows are generally used between each row of trees, the furrows passing along under the tips of the branches. What is known as a lath-funnel is inserted in the lateral to supply each space between rows. This is made by nailing four laths together so as to leave an opening about one-half by one inch. This supplies the water just about fast enough, so that it requires little or no attention. A slowly running stream well managed does best work, and with a stream of this size the ground will be sufficiently watered in from five to twenty hours. This will not need to be repeated oftener than once in three weeks. Rows for irrigation should not be over 300 feet long. The furrows are made with a one-horse shovel-plow. If water is applied to one side of the tree only it will cause the tree to lean toward that side. To determine whether the land needs water, take up a sample of the soil five or six inches below the surface; if this will ball in the hand no water should be applied. One thousand barrels of water at each application is sufficient for an acre. In young orchards it is sometimes customary to run four furrows between each row of trees instead of two. Cultivation is just as essential as irrigation, and can no more be dispensed with in irrigated than in unirrigated sections. Special tools have been devised for orchard cultivation which will pack the lower layers of soil just as little as possible. The aim is always to get the water to soak four or five feet into the soil. For this reason it is important that the land should be thoroughly subsoiled before planting unless the subsoil is so open as not to require it. Water should never be applied to trees when in bloom. The most important time to irrigate orchards is when the buds are forming for the next year's crop. In eastern Colorado this occurs in August. No further watering is given until just as the trees go into winter quarters, or just before the ground freezes. This year the Colorado people are irrigating in January. Water should never be allowed to come in contact with the trunk of the trees, and for this reason the flooding system is not well adapted to orchard work. The greatest enemy to irrigation is the evaporation caused by the rays of the sun. This entails much additional labor in the matter of cultivation. It requires two men to irrigate and care for fifteen acres of orchard during the season.

Subirrigation is too costly for any ordinary crops, and in orchard work the roots are sure to fill up the tiles. A machine is in use which makes and lays a continuous tile in position beneath the ground at the least possible cost, but even then the cost is $400 per acre. The equivalent of seven inches in depth over the entire surface of the land is considered a satisfactory amount to apply at one time in Colorado, and three applications usually suffice for the growing season. The water used in winter is in addition to this. Potato growers, however, are now coming to give nine or ten irrigations. If possible to avoid it, no water is applied until the tubers begin to form, but thereafter it is given every ten days. If is very injurious to let Potatoes stand for two or three weeks and then apply water again, as that induces a second growth.

In the discussion following this paper it was stated that one million acres can be irrigated in Nebraska from canals now under construction, and probably one million acres more from canals proposed. The point was also made that with the greater rainfall and diminished evaporation in Nebraska much less water would be required for the same area than in Colorado.

THE CONSERVATION OF SOIL MOISTURES.

Professor T. L. Lyon, of the State University, said that this is a subject of paramount import west of the Missouri River; it is estimated that fifty per cent. of the rainfall of the eastern states is lost by running away on the surface and by percolation, while in Nebraska only about ten per cent. is lost in the same way. The primary cause of droughts in this region is not insufficient rainfall, but excessive evaporation. Nebraska soil contains a large proportion of silt and comparatively little clay. The finer the particles the closer they will pack, hence the result is that the lower layers of our soil are exceedingly compact. A loose soil will allow water to sink into it much more rapidly, and will also retain this water much better, than a compact soil. From these facts it is easy to see the value of subsoiling as a means of retaining moisture. Its value, however, depends upon the condition of the subsoil. It is beneficial when the subsoil is compact, but may be useless or even injurious when the subsoil is open and sandy. The work should preferably be done in the fall rather than in the spring, in order to retain to the fullest extent whatever moisture falls during the winter and early spring months. Next in importance to subsoiling should be ranked fall plowing, as this accomplishes the same object, though in a less degree. Failing in this the earlier in the spring the work can be done the better. Thorough and frequent cultivation during the summer is most important. The same qualities of soil which make the subsoil compact also make it a good carrier of water by means of capillarity. The layer of loose soil formed by cultivation simply acts as a mulch or blanket to prevent evaporation. This point was illustrated by lighting two lamps, in one of which the wick had been cut apart and a piece of hemp sewed between to break up the capillarity. In this case the blaze quickly died out. For the same reason it is advantageous to plow stubble land as soon as the grain is off. This not only aids in conserving moisture, but the land is then in better condition to plow than later on.

SUNSHINE AND CLOUDINESS IN RELATION TO CROPS.

In a paper on this subject by Professor G. D. Swezey, of the State University, it was stated that May is the cloudiest month in Nebraska and September the clearest. Taking the length of the day into consideration, it is found that the greatest amount of sunshine is found in July, which in turn is followed by August and September respectively. Not very much is known regarding the intensity of sunlight here, but it is known to be greater than in more humid regions. With normal rainfall the conditions for the growth of crops are almost ideal, since the greatest amount of sunshine occurs when the crops are ripening their fruits. The evaporation of this region is excessive, however, and partly by reason of the large amount and greater intensity of the sunlight.

STRAWBERRIES AND IRRIGATION.

This was the subject of a paper by Mr. J. W. Stevenson, who uses windmills with one and a quarter inch pipe laid on the surface of the ground, and finds the results very satisfactory. Pieces of rubber hose prove useful for connecting the pipe. This allows more freedom in laying pipes, and they can be easily taken apart and carried by one man from place to place as required. He thinks the windmill the cheapest power for lifting water, but it is liable to fail in the time when most needed, hence it is desirable to supplement the windmill with steam or horse power if necessary. He finds it a simple matter by means of wires and proper adjustments to attach a windmill to a pump in a well several hundred feet away. He believes heartily in subsoiling, and uses a tree-digger for this purpose, preferring it to the ordinary subsoil-plow. The land should then be thoroughly saturated with water during the fall or winter. When irrigating in warm weather it is necessary to cultivate the following day in order to prevent the ground

from baking. No harm results from the direct application of cold water as pumped from the ground, as he uses no reservoir and applies the water directly as pumped.

The Western New York Horticultural Society.—I.

FOR fifty years fruit-growing has been one of the leading industries of western New York, and the annual sessions of the Horticultural Society at Rochester are largely devoted to orchards, vineyards and small fruits. The long experience of the members of this society and the efficiency of its officers make its gatherings the most important convention of fruit growers held in this country. The meeting of last week was no exception to the general rule. More than five hundred members were registered as present; the exhibition of fruits and of implements designed to facilitate fruit-culture was large and varied, and the addresses, as usual, had a genuine practical value. The large hall was filled at every session, and well-known horticulturists were present from Michigan, Ohio, Connecticut, Maine, Virginia, Canada and the Hudson River Valley. Mr. W. C. Barry was elected president for the next year; Wing R. Smith, of Syracuse, vice-president; S. D. Willard, of Geneva, second vice-president, and John Hall, of Rochester, secretary and treasurer.

THE PRESIDENT'S ADDRESS.

President Barry, in speaking of the increased usefulness of this society, took occasion to commend the professors of agriculture and horticulture in Cornell University and in the experiment stations, who have helped materially not only by their presence, but by carefully prepared papers, to make the sessions of the society profitable. He also acknowledged the debt which the fruit growers of the present owe to the pioneers who founded this society and who had sufficient enterprise to collect different fruit plants from abroad, and by testing different varieties and experimenting in methods of culture had left an invaluable body of experience. The dry weather of the past year, which injured all crops, and especially small fruits, has impressed growers more than ever with the necessity of providing for a permanent water-supply, and it is generally felt that every care must be taken to save the rainfall. Underdraining, deep plowing, hillside reservoirs, wind-power, should all be tried, and every other method of securing that moisture which is absolutely essential to the production of crops. In reference to the marketing of fruit, Mr. Barry considered it a mistake to sell and ship it at the time of gathering. In many cases this is unavoidable, because growers have no place to store their fruits and therefore dispose of them hastily and often unprofitably. Ordinary farm buildings cannot be successfully used. It is advisable on every fruit farm to have a structure, even if a temporary one, which is suited for storing fruits. If these can be held back for a month, or even a fortnight, until the rush to market is over, good prices can usually be realized, and very often the increase in price thus secured will, in one season, nearly or quite pay for the building. This building may be of moderate size at first, and can be enlarged as necessity requires. Well-equipped houses for retarding the ripening of fruits and for cold storage are expensive, both to build and to maintain, but in any section where fruit-growing is carried on largely a company can be formed and a building constructed for common use, but for ordinary cold storage for single farms one can be built at small cost, and when once used it will be considered indispensable.

In regard to the fertilization of orchards, Dr. Van Slyke was quoted to the effect that farm-yard manures need to be supplemented with fertilizers containing phosphoric acid and potash to make a proper food for orchards. With every ton of stable manure it is well to mix from fifty to one hundred pounds of acid phosphate and from twenty to fifty pounds of crude muriate or sulphate of potash. Unleached wood-ashes, ground bone and potash salts are better than stable manure. A peck or half a bushel of ashes to a bearing tree, with three or four pounds of ground bone, is what is needed. Two pounds of potash salts can be substituted for the ashes. When unleached ashes of known purity can be bought at home they are worth buying if they do not cost too much. But all the potash and phosphoric acid they contain can be had much cheaper than by paying $10.00 a ton for ashes. Muriate of potash and bone meal cost two and a half cents a pound, and 150 pounds of it will furnish as much phosphoric acid as a ton of ashes, and both together will not cost half as much as ashes ordinarily do. Mineral manures can be handled quickly and at little expense. In short, few people realize how much it costs to distribute such a bulky fertilizer as barn-yard manure. Orchards which have outlived their usefulness should be cut up into firewood and not allowed to occupy valuable ground and breed destructive fungi and insects. In their place new orchards should be planted on ground perfectly prepared and well planted with a proper selection of trees. We have now remedies and preventives which enable us to keep in check insects or diseases which threatened the destruction of orchards and vineyards a few years ago. Spraying has become almost as common as cultivation, and we should test every new help, even to the importation of natural parasites, to help us in our war against insects.

Among the members of the society who have died during the year, and to whom Mr. Barry paid special tribute, were the venerable John J. Thomas, first president of the society, who died in his eighty-fifth year—a modest, capable man and a trusted authority, eminent in the practice and in the literature of the art of horticulture; Charles E. Cook, one of the largest fruit growers in the region of western New York and the inventor of a fruit-gatherer which is widely used; the brothers Moulsen, old nurserymen, of Rochester, both of whom had passed their fourscore years; the brothers Thomas and Edwin Smith, of Geneva, who for forty years have been eminent as nurserymen and fruit farmers, and Ethel C. Sherman, who had been for many years secretary of the Horticultural Society of Wyoming County.

THE COST OF A POUND OF GRAPES.

Mr. John W. Spencer, in speaking on this question, said, in part:

The Chautauqua grape belt, in the Lake Erie valley, is about fifty miles long, hemmed in on the south side by a ridge of precipitous hills, and the breadth of the valley available for fruit-culture varies from three to five miles. Through the centre of the valley runs a zone of gravel once the beach of the lake when it discharged into the Mississippi Valley through the gap where Chicago now stands. Between this beach-level and the present shore of the lake there is a belt of clay, and on the hillside a zone of glacial till. The gravelly land was once the highest-priced and bore better crops of grain, the clay was the best grass land and the hillside was a sheep pasture covered with mulleins and briars. At first the gravel was thought the most eligible for grapes, but now vineyards are found on the clay and the glacial drift, on which latter place the grapes are as good in quality and sometimes yield as much in quantity. The cost of the various processes in cultivation, such as cutting the curls, stripping brush from the wires, stretching wires, tying, tillage, etc., from spring up till the time of harvest, is about $9.00 an acre. How much a nine-pound basket costs depends on the man and his soil. In vineyards where there are no missing vines, and all are thrifty and even, an acre will yield a thousand baskets, and often twelve hundred, but the average grape grower of the region does well if he gets five hundred baskets, and the careless vine dresser gets all he deserves if he has two hundred and fifty. With five hundred baskets to the acre each one will cost one and eight-tenths cents. But this nine dollars which has been expended since early spring does not take the grapes to the freight-car, and, indeed, it pays for only one-quarter of the journey. The cost of baskets, handling, picking, packing, attendance in various ways and hauling is yet to be met, so that harvesting the grapes cost $27.00 more an acre, making a total of $36.00. In 1894 grapes were 11¼ cents a basket at the car door, or $58.75 an acre, which left $22.75 of profit. Out of this must be taken the taxes, interest, wear of implements, posts, crates and sometimes fertilizers, which, of course, vary in individual instances.

Fruit-growing is every year becoming more and more a profession which combines skill and science, and the man who is best paid is he who raises the most difficult products. Fifty men are competent to produce crops where there is one competent to raise mushrooms, but mushrooms bring fifty times as much a pound as grapes. The exceptionally skilled horticulturist can find a better business than growing grapes. The man who raises five hundred baskets to the acre pays twice as much for cultivating the same product as the man who raises a thousand, but the difference is only $9.00 an acre. Superior skill only tells in raising a crop. Large yields do not cheapen the cost of harvesting and transporting. Superior fruit does not bring superior prices under coöperative selling, as is done in Chautauqua. The straggling bunches of the careless man are dumped into the same cars with those of the most skilled grow-

ers," the car-load is sold as a whole, and the pay is made pro rata according to the number of baskets, so that coöperative shipping has disadvantages as well as advantages, and it is the skilled grower who suffers—that is, he does not reap the full reward of his superior knowledge.

Notes.

Since October 1st, 792,431 barrels of domestic potatoes have been offered in the markets of this city, 296,031 barrels in excess of the supply a year ago. During the past week there were received 30,934 barrels of the home crop, besides small shipments from Europe, Bermuda and the West Indies.

The first Florida strawberries of the season may be had at $1.00 to $1.25 for a quart box. The only Tangerine oranges now available are tiny specimens from California, and these cost the excessive sum of $10.00 a box, wholesale. The few Mandarins offered are from Italy, and thirty-four half-boxes of this fruit from Sorrento, landed on Monday, sold for $5.50 on the dock.

Another part of the important *Flora of Nebraska*, edited by members of the Botanical Seminary of the University of Nebraska, already noticed in these pages, has been issued. It is part 21 of the whole work, and is devoted to the Rosales, the author being Mr. Axel Rydberg. In this group are treated Rosaceæ, Cæsalpiniaceæ, Mimosaceæ and Papilionaceæ, these three families being formed from the Leguminosæ as limited by Bentham, the Saxifragaceæ, Crassulaceæ, Hamamelidaceæ and Grossulariaceæ. The editorial committee of this important work, Professor Charles E. Bessey, Roscoe Pound and F. E. Clements, announce that part 8, devoted to the Fungi Imperfecti, is approaching completion.

Formerly Cuban and domestic cigar boxes were all made from the wood of the Spanish Cedar, a species of West Indian Cedrella, but now the demand for boxes to hold cheap domestic cigars is so great in this country that other woods, stained to resemble Spanish Cedar, are largely used for the purpose. The wood of the Tulip Poplar, Liriodendron, is considered the best of the North American woods for this purpose, although chestnut, butternut, elm, basswood and cottonwood have been tried. Cigar boxes are also now very largely made in the United States with veneers of Spanish Cedar cut in thicknesses of from eighty to one hundred and twenty sheets to one inch and mounted on cheap American woods like cottonwood or basswood.

A report of the importations of bananas into the United States during 1895, issued by Bennett, Walsh & Co., of this city, shows that 186 cargoes of this fruit have been landed. Jamaica furnished more than any other country, 4,108,620 bunches coming from that island. Bocas del Toro, a port of the United States of Colombia, and Bluefields, each sent out more than 2,000,000 bunches, and a like total came from Belize, Livingston and Honduras, and also from Banes and Cabanes, with nearly as many from Port Limon. These, with importations from minor ports, amount to 16,720,127 bunches. Of this grand total 5,088,119 bunches arrived in New Orleans, 4,548,572 in New York; Mobile comes third with 2,449,618, followed by Philadelphia with 2,026,780, Boston 1,637,802, Baltimore with less than a million, and Charleston with only 41,000 bunches.

Well-blanched celery from California sells at $1.10 for a bunch of a dozen stalks; that from Rochester brings $1.00 a dozen, and, while less white and showy, is considered of higher quality. Small heads of cauliflower from California cost thirty to sixty cents each, and larger heads from France bring seventy-five cents. Brussels sprouts from the latter country sell for twenty-five cents a pound, and artichokes for the same price each. New string beans, beets and egg-plants come from Florida, besides tomatoes. The latter sell for twenty cents a pound, the price, also, of California tomatoes, the hot-house product, bringing thirty-five cents. Peppers, from Cuba, cost forty cents a dozen. Other vegetables now in season in our markets are celeriac, new leeks and onions, Spanish onions, sweet potatoes, Savoy and Danish cabbage, the green Hubbard and yellow squashes. Tender blades of sorrel and dandelion, grown under glass on Long Island, are in considerable demand, and sell, respectively, for fifteen and twenty-five cents a quart.

Currants are grown successfully at the Geneva Experiment Station on a southern slope with soil of rather a heavy clayey loam and a clay subsoil. This is well drained by lines of tiles two rods apart. The bushes are set four feet apart in the rows, and the rows are from six to seven feet apart. A forkful or two of stable manure is thrown around each bush in autumn and turned under, but not deeply, in spring. The ground is cultivated two or three inches deep near the plants, and rather deeper midway of the rows at the first cultivation, after which, by shallow tillage, the surface is kept stirred and free from weeds until August. In fall the five-year-old canes are cut away with the broken branches with all those that droop to the ground, and all but one or two new shoots of one season's growth. No unvarying rule can be followed in pruning, but it is thought that generally a cane reaches its greatest productiveness during its fourth or fifth season. If a cane still appears vigorous after its fifth year's growth and well filled with buds it is allowed to remain longer. Under this treatment the bushes make enough wood and yield abundantly.

The council of the New Mexico Agricultural Experiment Station has passed a series of resolutions which have been sent to the stations of the different states, relating to the injury done by the introduction of scale and other insects from the West Indies and Central America into the southern states. After setting forth the fact that some of these insects may live over a large portion of this continent, as does the West Indian Diaspis Amygdali, which is now attacking Peach-trees as far north as Washington, and that experience in California has proved it possible to prevent by inspection the introduction of many pernicious insects, it is recommended that quarantine officers be appointed by the agricultural experiment stations of the several states, and paid out of the funds of these states, to be stationed at Key West, Mobile, New Orleans, Galveston and other ports, to examine plants introduced, to destroy those found infested and to issue a certificate for those which have been passed. It is also recommended that a skilled entomologist be appointed by the Department of Agriculture to travel in Mexico, Central America and the West Indies, make collections of injurious insects, investigate their habits and transmit his collection, with report, to the National Museum.

A writer in the *Scottish Geographical Magazine*, speaking of Formosa, states that the clearing of the forests of Camphor-trees there is going on at a very rapid rate. Many of the trees are cut up for making camphor; others are sawn into planks and knees for the building of boats. For over thirty years there has been a constant demand for camphor, and yet the Chinese Government has done nothing to prevent the reckless waste of these forests, and has taken no steps for the replanting of the tracts which are useless for cultivation. It is said that in the mountains of the interior Camphor-trees are still abundant, and there is no immediate fear that the supply will run short; but the increased demand for camphor in these days of smokeless powder will hasten the destruction of the trees, and it is therefore to be hoped that under the administration of the Japanese Government, which as a result of the war with China has come into possession of this territory, care will be taken to insure a future supply by planting these waste lands. The trees grow very rapidly and reach a height of forty feet in twenty years, and probably trees which are fifty years old will be large enough for all the ordinary purposes to which the timber is applied. To secure the camphor, distilleries of mud bricks some ten or twelve feet long, six feet wide and four feet high, are built on the hillsides, with five to ten fire-holes a foot apart and the same distance above the ground in each. An earthen pot full of water is placed over each fire-hole, and above it a tube a foot in diameter passes through the structure appearing above it. The tube is capped by a large inverted jar with a packing of damp hemp between the jar and the cylindrical tube, which is filled with chips of wood, about the size of the little finger, resting on the perforated lid covering the jar of water, so that when the steam rises it passes up to the inverted jar or condenser, absorbing the resinous material from the wood on its way. While the distillation is going on an essential oil is produced and is found mixed with the water on the inside of the jar. When the jar is removed the beady drops solidify, and crude camphor, crystallized like newly formed snow, is detached by the hand, placed in baskets lined with Plantain leaves and sent away to the nearest town for sale.

Publisher's Note.

A portion of the issue of GARDEN AND FOREST last week was printed on paper of a different color from that ordinarily used. Subscribers who return such copies will be furnished with others printed on our regular paper.